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EXAMINER	
BRINEY III, WALTER F	

ART UNIT	PAPER NUMBER
2644	4

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/062,686	Applicant(s) NORDIN ET AL.	
	Examiner Walter F Briney III	Art Unit 2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 January 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4,5,8-13 and 16* is/are rejected.

7)☒ Claim(s) *3,6,7,14 and 15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 8-13, and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by French et al. (US Patent 6,317,494).

Claim 1 is limited to 1 **a digital subscriber line (DSL) compatible plain old telephone service (POTS) line card to interface a telecommunications switching system to a subscriber over a two-wire subscriber line**. French discloses a line compensating CODEC (abstract; figure 3, elements 7531, 7536). The CODEC is a part of a POTS line card (all of figure 3), the POTS line card blindly provides POTS service derived from a PCM bus (i.e. **a telecommunications switching system**) to a telephone set (i.e. **a subscriber**) over a telephone loop (i.e. **two-wire line**) (column 2, lines 49-61). French discloses measuring the impedance of the telephone loop (column 1, lines 48-55). By measuring the impedance of the telephone loop, French is able to better set the receive and transmit equalizers, return loss, terminal balance, noise, and distortion parameters (column 1, lines 15-45). Measuring line impedance can be summarized as determining the cumulative effect of all resistive and reactive

components that affect the line impedance. Thus, a DSL line card will affect the line impedance, as it is connected in parallel to the SLIC of French. French would then inherently detect the presence of a DSL line card (i.e. **means for detecting whether a DSL line card is connected to said subscriber line**). French discloses that in response to line impedance measurements, **a digital signal processor** will adjust CODEC equalization parameters and both impedance and resistance termination values (column 3, lines 1-25). It is clear that when a DSL card is not affecting the line impedance a first set of parameters will be used by the CODEC (i.e. **responsive to said means for detecting configured to process voice-band signals with a first set of parameters if said DSL line card is connected to said subscriber line**), while a second derived set will be used upon detecting the line impedance with a DSL card present (i.e. **configured to process voice-band signals with a second set of parameters if said DSL line card is not connected to said subscriber line**). Therefore, French anticipates all limitations of the claim.

Claim 2 is limited to **a DSL-compatible POTS line card in accordance with claim 1**, as covered by French. French discloses that the **impedance** of a **subscriber line** is determined in order to better control impedance and frequency equalization (column 3, lines 1-25), wherein, the presence of a DSL line card will inherently be detected because it will affect the line impedance (i.e. **wherein said means for detecting is configured to detect a DSL line card connected to said subscriber line by measuring impedance in said subscriber line**). Therefore, French anticipates all limitations of the claim.

Claim 8 is limited to **a DSL-compatible POTS line card in accordance with claim 1**, as covered by French. French discloses measuring the subscriber loop impedance in order to develop appropriate CODEC frequency equalization settings (column 3, lines 1-25; column 6, line 48-column 7, line 10) (i.e. **wherein said first set of parameters adjusts a frequency response of said subscriber line**). Therefore, French anticipates all limitations of the claim.

Claim 9 is limited to **a DSL-compatible POTS line card in accordance with claim 1**, as covered by French. French discloses adjusting complex termination impedance settings based on subscriber loop impedance measurements (column 3, lines 1-25), wherein a matched termination impedance increases the return loss of signals transmitted onto the subscriber loop (i.e. **wherein said first set of parameters adjusts a return loss of said subscriber line**). Therefore, French anticipates all limitations of the claim.

Claim 10 is limited to **a DSL-compatible POTS line card in accordance with claim 1**, as covered by French. French discloses adjusting terminating resistances and impedances based on subscriber loop impedance measurements (column 3, lines 1-25), wherein adjusting these values results in less reflection of transmitted signals into the receive path (i.e. **wherein said first set of parameters adjusts a trans-hybrid loss of said POTS line card**). Therefore, French anticipates all limitations of the claim.

Claim 11 is limited to **a method for use in a DSL-compatible POTS line card connected to a subscriber line**. French discloses a line-compensating CODEC (abstract; figure 3, elements 7531, 7536) (i.e. **a digital signal processor**) as part of a

line card (all of figure 3). The CODEC measures subscriber loop impedance, wherein the loop impedance comprises all electrical elements attached thereto, such that a subscriber loop impedance measurement inherently determines the presence of a DSL line card because it will affect the impedance measurement (column 1, lines 48-55) (i.e. **determining whether a DSL line card is connected to said subscriber line**). French discloses that the CODEC adjusts frequency equalization parameters and termination parameters based on the subscriber loop impedance measurement (column 3, lines 1-25), such that when a DSL line card is present, one group of settings will be derived (i.e. **loading a digital signal processor with a first set of parameters if a DSL line card is connected to said subscriber line**) and a second group of settings will be derived in the absence of a DSL line card (i.e. **loading a digital signal processor with a second set of parameters if a DSL line card is not connected to said subscriber line**). Therefore, French anticipates all limitations of the claim.

Claim 12 is limited to **a method in accordance with claim 11**, as covered by French. French discloses performing the measurement at all off-hook events (figure 1, step 101) (i.e. **wherein said step of determining occurs periodically**). Therefore, French anticipates all limitations of the claim.

Claim 13 is limited to **a method in accordance with claim 11**, as covered by French. French discloses that the subscriber loop impedance measurement comprises the steps of generating a POTS signal to be sent on the subscriber loop (i.e. **sending a tone on said subscriber line**), measuring its reflection (i.e. **measuring a reflection of said tone**), and determining a ratio between the transmitted tone and the reflection

(column 3, line 55-column 2, line 31) (i.e. **basing said determination on a parameter of said reflection**). Therefore, French anticipates all limitations of the claim.

Claim 16 is limited to **a method in accordance with claim 11**, as covered by French. French discloses a process of subscriber loop impedance measurement (figures 1 and 2; column 1, line 55-column 2, line 31), wherein the impedance measurement inherently results in the detection of all devices, including DSL line cards, which affect the impedance of the subscriber loop (i.e. **wherein said step of determining comprises: measuring an impedance of said subscriber line**). Therefore, French anticipates all limitations of the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over French in view of Frantz et al. (US Patent 5,802,169).

Claim 4 is limited to **a DSL-compatible POTS line card in accordance with claim 1**, as covered by French. French discloses measuring the loop impedance by generating POTS frequency tones (i.e. **generating a voice band tone**) and measuring their reflected energy (i.e. **measuring a reflected energy**) versus a corresponding known transmitting energy (i.e. column 1, line 55-column 2, line 31). While French

discloses determining the reflected energy and adjusting CODEC parameters based on this measurement , French does not disclose how the parameters are expected to be adjusted based on the impedance measurement, only that they are adjusted to provide a close approximation. Therefore, French anticipates all limitations of the claim with the exception **wherein a DSL line card is detected when said reflected energy is below a threshold**. Frantz teaches a DSP (figure 1, element 101) that adjusts the termination impedance (112) based on a measured signal impedance (column 2, lines 47-62) that is obtained in a fashion similar to that of French, i.e. injecting a tone and measuring the reflection (figure 5). Frantz discloses that because all lines are different, models are not fully accurate (column 1, lines 58-64). Therefore, after determining a line impedance, the model can be varied to achieve a best fit termination impedance, wherein a series of models are compared to the actual line, and a best model is selected (figure 6). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the modeling procedure as taught by Frantz for the purpose of performing the termination impedance that is disclosed by French, but not detailed.

Claim 5 is limited to **a DSL-compatible POTS line card in accordance with claim 4**, as covered by French in view of Frantz. Neither French nor Frantz offer any examples of POTS band tones to transmit for impedance measurements, however, Frantz does suggest using whiteband noise, which would include many frequencies simultaneously. However, even if this was the case, no specific frequencies are suggested. Therefore, French in view of Frantz makes obvious all limitations of the claim with the exception **wherein said voice band tone is selected from the group of**

2.6, 3.0 and 4.0 kHz. While neither French nor Frantz disclose or teach the exact frequencies used by their tone generators, it would have been obvious to use any of the frequencies claimed. Because the applicant has not specified in the written description any suggestion of advantage or nonobvious result gained by using the specific frequencies recited herein, it would have been obvious to one of ordinary skill in the art at the time of the invention to use said frequencies as a mere matter of selecting POTS band frequencies for transmission, i.e. using either 2.6, 3.0, or 4.0 KHz tones is a mere design choice.

Allowable Subject Matter

Claims 3, 6, 7, 14, and 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 3 is limited to **a DSL-compatible POTS line card in accordance with claim 2**, as covered by French. French discloses measuring the loop impedance by generating POTS frequency tones and measuring their reflected energy versus a known transmitting energy (i.e. column 1, line 55-column 2, line 31). Therefore, French anticipates detecting the presence of a DSL line card based on measurements taking within the POTS band, however, does not disclose detecting **approximately 100 ohms at DSL Frequencies in parallel with the subscriber load**. Vasquez (WO 99/52256, October 1999) teaches a loop attenuation monitor (abstract). Attenuation is one of the components used by French for impedance measurement. Vasquez also teaches that

signals above the POTS band provide more sensitive and accurate loop attenuation measurements. However, Vasquez is directed toward detecting discontinuities on a subscriber loop, and not generating a frequency map as French. Therefore, no motivation exists in the cited prior art to use signals outside of the POTS band in the subscriber loop impedance measurements of French.

Claim 6 is limited to **a DSL-compatible POTS line card in accordance with claim 1 wherein said means for detecting is configured to detect a DSL line card connected to said subscriber line by generating a tone above voice band**. As discussed in claim 3, no motivation exists in the French reference to use signals outside of the POTS band in subscriber loop impedance measurements. Therefore, claim 6 is allowable over French.

Claim 7 is dependent on claim 6 and is allowable for the same reasons.

Claim 14 is limited to **a method in accordance with claim 11**, as covered by French. French discloses generating POTS band tones and measuring the reflection of the reflections associated with that tone, however, French does not use tones based in the DSL frequency range. Therefore, French anticipates all limitations of the claim with the exception **wherein said step of determining comprises: measuring energy in a DSL frequency range and basing said determination on the presence of energy**. As shown in claim 3, French does not provide any motivation to monitor DSL frequencies for the purpose of performing line impedance measurements. Therefore, Claim 14 is allowable over French.

Claim 15 is limited to **a method in accordance with claim 11**, as covered by French. French discloses a process of subscriber loop impedance measurement (figures 1 and 2), which inherently detects the presence of any and all devices attached to the line that affect the impedance of that line. However, French does not disclose specifically sensing the presence of DSL. Therefore, French anticipates all limitations of the claim with the exception **wherein said step of determining comprises: monitoring said subscriber line for DSL pilot tone**. French makes no mention of DSL monitoring, and as such, adding a DSL pilot tone detector, which is a well-known method of detecting DSL would not have been obvious. As previously shown, French discloses a CODEC that implicitly monitors a subscriber loop for all types of line distorting objects, thus including a DSL pilot tone detector would not provide any extra benefit. Therefore, claim 15 is allowable over French.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter F Briney III whose telephone number is 703-305-0347. The examiner can normally be reached on M-F 8am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester W Isen can be reached on 703-305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

WFB
7/23/04

XU MEI
PRIMARY EXAMINER